JUN 1 3 2012

ACTION MEMORANDUM

SUBJECT: Approval and Funding for a Removal Action at the Radiation-Standard Products, Inc. (Former) Site, Wichita, Sedgwick County, Kansas

FROM: Randy Schademann, On-Scene Coordinator
Planning and Preparedness North Section

THRU: Don Lininger, Chief
Planning and Preparedness North Section

TO: Cecilia Tapia, Director
Superfund Division

30245760
Superfund

SITE ID#: A7N1

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval and funding for a fund-lead, time-critical removal action at the Radiation-Standard Products, Inc. (Former), site (Site). Radiation-Standard Products is located at 650 East Gilbert Street, Wichita, Sedgwick County, Kansas. The site is not nationally significant or precedent setting.

As detailed below, the objective of this removal action is to protect public health or welfare or the environment by responding to the release of hazardous substances and pollutants or contaminants into the environment as presented by materials contaminated with radium-226 at 650 East Gilbert Street. Contaminated materials that exceed 5 pico Curies per gram (pCi/g) plus background will be excavated, transported and disposed of at a licensed facility.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID#	KSN000705966
Category of Removal:	Time Critical

A. Site Description

1. Removal site evaluation

The Kansas Department of Health and Environment (KDHE) Bureau of Air and Radiation (BAR) licensed radium dial shops. According to the BAR records, Standard Products

PPNS	PPNS	CNSL	CNSL	ERNB	SUPR	SUPR	SUPR
Schademann	Lininger	Roberts	Gonzales	Buchholz	hankins	Jackson	Tapia
6/13/12	6/13/12	6/7/12	6/13/12	6/13/12	6-13-12	6/13/12	6/13/12

operated a facility repairing aircraft instruments from approximately 1952 to 1965. By 1965, the facility had relocated to 4105 West Pawnee and changed its name to Standard Precision, Inc.

Radium in luminescent paints was widely used for aircraft dials, gauges and other instruments. Radium dial repair shops were located in Wichita to upgrade and repair radium-bearing aircraft instruments. During this process, paint containing radium was stripped from the dials with solvent prior to the dials being repaired.

In an ongoing effort to evaluate these facilities, KDHE conducted field work in August, September and December 2007, to support a Unified Focus Assessment (UFA) issued in February 2008. Five groundwater samples and 24 soil samples at 650 East Gilbert Street were collected for the UFA. Samples were analyzed for radium-226; the eight Resource Conservation and Recovery Act (RCRA) metals (which are lead, arsenic, barium, cadmium, chromium, mercury, selenium and silver); and volatile organic compounds. The UFA identified several areas that had elevated radium concentrations exceeding the standard established in the Code of Federal Regulations (CFR) at 40 CFR § 192.12 for a cleanup level not to exceed background plus 5 pCi/g (up to 81,800 pCi/g of radium-226). No samples were taken or field screening conducted at the 920 South St Francis parcel during the KDHE's UFA because the assessment was limited to the facility where dial work was thought to have occurred.

The U.S. Environmental Protection Agency (EPA) conducted field activities for a Removal Site Evaluation (RSE) in March and April of 2009. Field screening with radiation detectors and radiation analysis of soil samples further defined the vertical and aerial extent of contamination. Results of the field screening depicting areas showing radiation above background values are provided in Figure 1.

During the EPA-lead Removal Site Evaluation in March 2009, it was determined that some radium-contaminated material from the Site had been moved to 920 South St. Francis, an adjacent residential parcel, which was the subject of an EPA-lead removal action in July 2009. During that effort, approximately 453,700 pounds of radium-contaminated material was excavated, transported and disposed at a US Ecology facility in Idaho (EPA Fund-Lead Removal Action, July 9, 2009, and START Removal Action Report, Standard Products, Inc. [Former] – 920 S. St. Francis Parcel, Wichita, Kansas).

2. Physical location

The Site consists of three acres—the combined acreage of the 650 East Gilbert Street and 920 South St. Francis parcels in Wichita, Sedgwick County, Kansas (Figure 1). The 650 East Gilbert Street portion of the Site occupies approximately 2.67 acres. Both, 650 East Gilbert and 920 South St. Francis are located in the Northwest ¼ of Section 28, Township 27 South, Range 1 East. However, the removal action for the 920 South St. Francis parcel was conducted by Environmental Protection Agency in July 2009. Adjoining properties include commercial businesses adjacent the property to the south and north. On the east are railroad right-of-ways. Residential homes and a medical clinic are to the west and southwest.

3. Site Characteristics

The 650 East Gilbert Street parcel is largely vacant except for an 11,000-square-foot metal building that is currently utilized for equipment storage by an electric company. The 920 South St. Francis parcel has a single family residence. The area surrounding the Site is primarily

residential with some light industry and the Guadalupe Clinic, a health clinic, which borders both 650 East Gilbert and 920 South St. Francis. Residences and the Guadalupe Clinic are immediately to the west and south of the 650 East Gilbert portion of the Site.

An EPA fund-lead site removal was previously conducted at the 920 South St. Francis parcel by the EPA in the summer of 2009.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

The primary contaminant of concern at this Site is radium-226. The EPA and KDHE have documented radium-226 concentrations in soil exceeding 5 pCi/g plus background (up to 81,800 pCi/g on the 650 East Gilbert Street parcel being addressed by this removal action).

The KDHE BAR licensed radium dial shops. According to BAR records, Standard Products operated a facility repairing aircraft instruments from approximately 1952 to 1965. By 1965, the facility had relocated to 4105 West Pawnee and changed its name to Standard Precision, Inc.

Radium in luminescent paints was widely used for aircraft dials, gauges and other instruments. Radium dial repair shops were located in Wichita to upgrade and repair radium-bearing aircraft instruments. During this process, paint containing radium was stripped from the dials with solvent prior to the dials being repaired.

Radioluminescent paint—a mixture of a radionuclide, usually radium-226, and a phosphor, usually zinc sulfide—was developed in the early 1900s. The mixture was initially used on watch and clock faces and later adapted for use on instruments, most notably aircraft dials. As part of radium's decay process, it emits an alpha particle that can excite the phosphor which eventually releases a photon. The end results are dials that "glow" and can be read at night without light.

Radium has 25 known isotopes, four of which occur in nature, with radium-226 and to a lesser extent radium-228 being the most common. Radium-226 has the longest half-life at 1,602 years. Radium is a decay product of uranium and consequently is associated with uranium ores. Radium decays by emitting alpha and beta particles and gamma rays. Radium initially decays into radon, a heavy gas, which itself decays into other radioactive solids including polonium, bismuth, lead and thallium. Radium in soils does not biodegrade.

The current and past workers at the 650 East Gilbert Street parcel or passersby may have been and/or are being exposed via routes of inhalation or dermal contact from the radium-contaminated material, which is present at numerous areas at or near the surface. It also appears that the radium-contaminated material at the property is a source area for contamination of the area groundwater.

Exposure to high levels of radium results in an increased incidence of bone, liver and breast cancer. Radium, like calcium, is retained in bone tissue; bone cancer is the greatest risk from radium exposure. Death and decreased longevity have been reported as a result of long term exposure. Radium has also been shown to affect the blood (anemia), eyes (cataracts), and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters can lead to skin damage, hair loss, birth defects, general illness and cancer.

Radium-226 is a hazardous substance, as defined by section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is listed at 40 CFR § 302.4 as radionuclides.

5. National Priority List (NPL) status

The Site is not on nor is it proposed for listing on the NPL.

6. Maps, pictures, and other graphic representations

Figure 1 (Gamma Survey Results Map) is attached.

B. Other Actions to Date

1. Previous actions

Activities pertaining to the Site include:

- 1953-55, 1959, and 1962 – Kansas State Board of Health inspections.
- 2007 – Kansas Department of Health and Environment Unified Focus Assessment.
- 2009 – EPA Removal Site Evaluation.
- 2009 – EPA Fund-Lead Removal at the St Francis parcel.

There has been no known EPA or KDHE response action at the 650 East Gilbert Street parcel to reduce the risks posed by radium contamination.

2. Current actions

There are no current actions being undertaken at the Site.

C. State and Local Authorities' Roles

1. State and local actions to date

On November 20, 2008, KDHE referred this Site to the EPA for a response action. The EPA is closely coordinating Site activities with KDHE and the Sedgwick County, Kansas Health Department. The Sedgwick County, Kansas Health Department has volunteered to coordinate Site activities with the local governing bodies.

2. Potential for continued State/local response

Both KDHE and the Sedgwick County, Kansas Health Department will remain involved in future Site activities.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415(b) of the National Contingency Plan (NCP) provides that the EPA may conduct a removal action when it determines that there is a threat to human health or welfare or the environment based on one or more of the eight factors listed in section 300.415(b)(2). The factors that justify a removal action at the 650 East Gilbert Street parcel are outlined as follows:

300.415(b)(2)(i) – Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants.

Analytical results from samples collected by the EPA indicate that hazardous substances have been released into the soils at the Site. Radium-226 was identified in soils at 650 East Gilbert Street parcel up to 81,800 pCi/g.

Radium is highly radioactive; it is classified by the EPA and the National Academy of Science as a known human carcinogen and is listed in 40 CFR § 302.4 as a hazardous substance (as radionuclides). Because radium is similar in structure to calcium, it tends to gravitate to boney tissue. Exposure to high levels of radium results in an increased incidence of bone, liver and breast cancer. Radium has also been shown to affect the blood (anemia), eyes (cataracts), and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters (nuclides undergo spontaneous disintegrations that release energy and result in the transformation to a different atom) can lead to skin damage, hair loss, birth defects, general illness and cancer.

People using the medical clinic and surrounding residents that are within 150 feet of the 350 East Gilbert Street property to the west, southwest and south are exposed to the risks described above by exposure to radium by inhalation at the Site. Also, the property is utilized by a local electrical contractor who employs between 25-30 people who regularly visit the site for supplies exposing them to the risks described above via the route of inhalation.

300.415(b)(2)(iv) – High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

Radium has been detected in surface soils up to 81,800 pCi/g (during the KDHE UFA, see Figure 1 for location). Radium-contaminated soils may migrate via airborne dusts, surface runoff, percolation into groundwater, construction activity or children transporting soils/dusts into their homes after playing in the affected areas and foot traffic into residences.

The half-life of radium-226 is 1,602 years. It is highly probable that the Site will undergo physical changes during that time which would allow increased exposure.

The greatest risk to humans from radium is through ingestion of food and water contaminated with radium.

300.415(b)(2)(v) – Weather conditions that may cause hazardous substances, pollutants or contaminants to migrate.

Radium has been detected in surface soils up to 81,800 pCi/g. Radium-contaminated soils may migrate via airborne dusts at 650 East Gilbert Street.

300.415(b)(2)(vii)- The availability of other federal or state response mechanisms to respond to the release.

There are no other known federal or state response mechanisms to respond to the release.

IV. ENDANGERMENT DETERMINATION

The actual release of a hazardous substance at the 650 East Gilbert Street parcel, if not addressed by implementing the response action selected in this Action Memorandum, presents an imminent and substantial endangerment to the health of the public that comes in contact with the Site and to public welfare and the environment.

V. PROPOSED ACTIONS AND ESTIMATED COST

A. Proposed Actions

1. Proposed action description

SOIL/WASTE EXCAVATION, REMOVAL, AND REPLACEMENT

The discussion presented in the following two paragraphs is based upon a February 12, 1998, memorandum from Stephen Luftig, then Director of the Office of Superfund Remediation Technology Innovation (February 12, 1998, Directive number 9200.4-25).

Standards have developed for the cleanup of uranium mill tailings under Section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by Section 206 of the Uranium Mill Tailings Radiation Control Act of 1978 (UMCTRA), 42 U.S.C. § 7918, and regulations at 40 CFR § 192.12. Pursuant to the above, the purpose of these standards was to limit the risk from inhalation of radon decay products of houses built on land contaminated with tailings and to limit gamma radiation exposure to people utilizing the contaminated land.

Subpart B of 40 CFR 192.12 lists two standards as cleanup levels for surface and subsurface soils. The cleanup level is not to exceed background level, plus the following:

- 5 pCi/g of radium-226 for surface soils which is a health-based standard. The basis for the standard is the health risk caused by exposure to gamma radiation.
- 15 pCi/g of radium-226 for subsurface soils which is not a health-based standard, but rather was developed for use in field measurements, rather than laboratory analyses, to determine when buried tailings had been detected.

Because the soil contamination on the 650 East Gilbert Street parcel is relatively shallow, mimicking the mill waste for which Uranium Mill Tailings Radiation Control Act of 1978 was developed, the 5 pCi/g plus the background concentration will be used throughout the Site. A background concentration of 1.87 piC/g was developed as the mean of samples collected by the EPA and KDHE for an action level of 6.87 piC/g.

All site-sampling activities for comparison to the action levels will be conducted in accordance with an approved Quality Assurance Project Plan.

After removing the estimated 1,100 tons of contaminated soil from the affected area, the excavated soils will be replaced with clean soils. Clean soils are soils that have been analyzed for radium, with results indicating that the concentration is at or below the background and that all other hazardous substances, pollutants or contaminants are below residential soil screening levels as determined by the EPA, or as referenced in the Region 9 Preliminary Remediation Goal tables found at http://www.epa.gov/Region9/waste/sfund/prg/index.htm, or as outlined in the KDHE RSK Manual, Version 4, 2007.

The excavated material will be transported and disposed of at a licensed facility in accordance with all applicable local, state and federal requirements.

At this time, no post removal Site control will be necessary.

2. Contribution to remedial performance

The fund-lead actions proposed in this Action Memorandum should not impede any future remedial plans or other response.

3. Applicable or Relevant and Appropriate Requirements (ARARs)

The following specific Applicable or Relevant and Appropriate Requirements been identified for this action:

Federal Applicable or Relevant and Appropriate Requirements

- Occupational Safety and Health Act Standards at 29 CFR part 1910 will be applicable to all actions.

- Department of Transportation Regulations at 49 CFR parts 107 and 171-177, Department of Transportation hazardous material transportation regulations, may be relevant and appropriate for transportation of the contaminated soils.

- The CERCLA Off-Site Rule promulgated pursuant to CERCLA section 121(d)(3), 42 U.S.C. § 9621(d)(3), and formally entitled "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action: Final Rule," 58 Fed. Reg. 49200 (Sept. 22, 1993), codified at 40 CFR § 300.440.

- Section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by Section 206 of the UMCTRA, 42 U.S.C. § 7918; 40 CFR part 192, as previously described in Section V (Proposed Actions).

- Subtitle D of the RCRA, Section 1008, Section 4001, et seq., 42 U.S.C. §6941, et seq., State or Regional Solid Waste Plans and implementing federal and state regulations.

- 10 CFR part 61, particularly 10 CFR §§ 61.7(a)(2), -61.41, -61.56, -61.81, Substantive requirements of the Licensing Requirements for Land Disposal of Radioactive Waste.

State ARARs

The EPA sent a state ARARs request letter to KDHE on May 17, 2012, and is currently awaiting the KDHE response. State ARARs will be addressed during the removal as deemed appropriate.

4. Project schedule

Response activities are anticipated to begin within 30 days of the signing of this Action Memorandum. It is anticipated that the project will require approximately 20 days to complete.

B. Estimated Costs

Extramural Costs	$1,100,000
Extramural Cost Contingency (20 percent)	220,000
Total Removal Action Project Ceiling	$1,320,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will result in a continued threat to public health or welfare or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

See the attached Confidential Enforcement Addendum for the Site. For NCP consistency purposes, it is not a part of this Action Memorandum.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be $1,715,144.

Direct Extramural Costs	$1,320,000
Direct Intramural Cost	25,000
Indirect Costs (27.52 percent)	370,144
Total Costs	$1,715,144

Direct costs include direct extramural and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost-accounting methodology effective October 2, 2000. These estimates do not include prejudgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

IX. RECOMMENDATION

This decision document represents the selected removal action for addressing the hazardous substances, pollutants or contaminants present at the Site. The removal action was developed in accordance with CERCLA, as amended, and is not inconsistent with the National Contingency Plan. This decision is based on the Administrative Record for the Site.

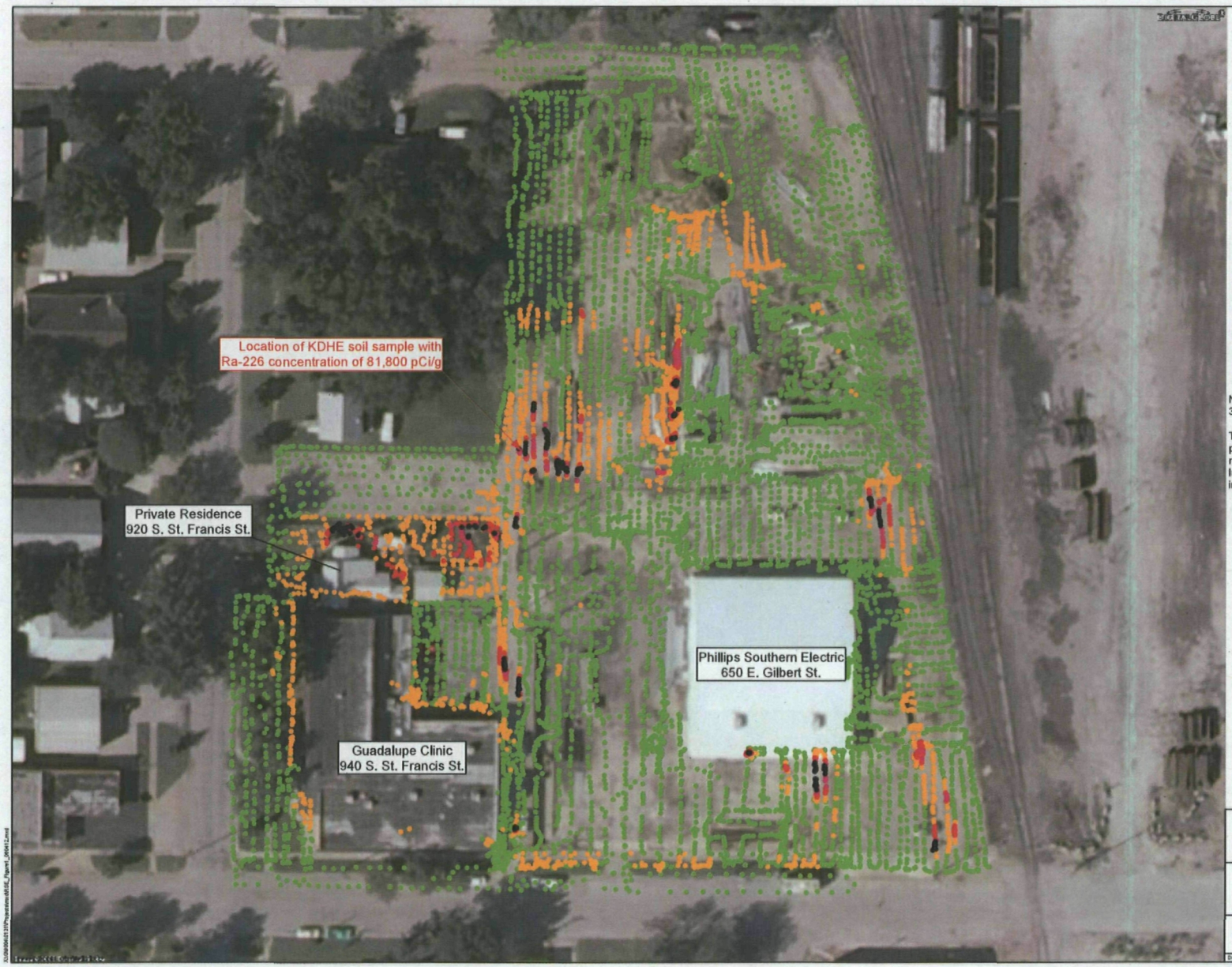
Conditions at the Site meet National Contingency Plan section 300.415(b) criteria for a removal action, and I recommend your approval of this proposed removal action. The removal ceiling, if approved, will be $1,320,000. This amount comes from the Regional Removal Allowance.

Approved:

_____ _____

Cecilia Tapia, Director Date
Superfund Division

Attachments:
Figure 1: Site Layout and Gamma Survey Results
Confidential Enforcement Addendum



Legend

Gamma Survey Location

- < 17,659 cpm
  Below Investigation Level
- 17,659 - 31,794 cpm
  Investigation Level to 2x Background
- 31,794 - 47,691 cpm
  2x Background to 3x Background
- 47,691 - 63,588 cpm
  3x Background to 4x Background
- > 63, 588 cpm
  > 4x Background

Local Road

cpm - counts per minute
KDHE - Kansas Department of Health and Environment
pCi/g - picoCuries per gram
Ra-226 - Radium-226

Notes: Measurements were collected using a Ludlum 3x3 detector.

The Investigation Level is the mean of background readings plus 10 times the standard deviation of the background readings. Areas that exhibited gamma activity above the Investigation Level were subjected to additional investigation following the initial surface soil gamma survey.

N

30 0 30

Feet

Note: The Environmental Protection Agency does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any injury or loss resulting from the reliance upon the information shown.

Source: RAT System Survey, March 2009
Image Connect, Globe Xplorer Premium Stack, 2008
ESRI Media Kit, 2007

Radiation - Standard Products, Inc. (Former)
Wichita, Kansas

Figure 1

Gamma Survey Results Map

TETRA TECH EM INC.

Date: 06/04/2012 Drawn By: Colin Willis Project No: 103D8004L080131000